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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Lockheed Martin Corporation
Information Systems Co.
12506 Lake Underhill Road
Orlando, FL 32825

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As part of the Defense Modeling and Simulation Office (DMSO) High Level Architecture (HLA) development effort, the Semi-Automated Forces (SAF) subsystems of the Close Combat Tactical Trainer (CCTT) were modified to support CCTT participation in the Platform Proto-Federation (PPF) experiment. Following the prototyping effort, DMSO sponsored continued research to support the evolution of HLA.

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DO SUMMARY REPORT CDRL A005

FOR

PARTICIPATION OF CCTT SAF IN HLA - PLATFORM PROTOFEDERATION (HLA/PPF) DO #0004

FOR: NAWCTSD/STRICOM
12350 Research Parkway
Orlando, FL 32826-3224
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BY: Lockheed Martin Corporation
Lockeed Martin Information Systems
ADST II
P.O. Box 780217
Orlando, FL 32878-0217

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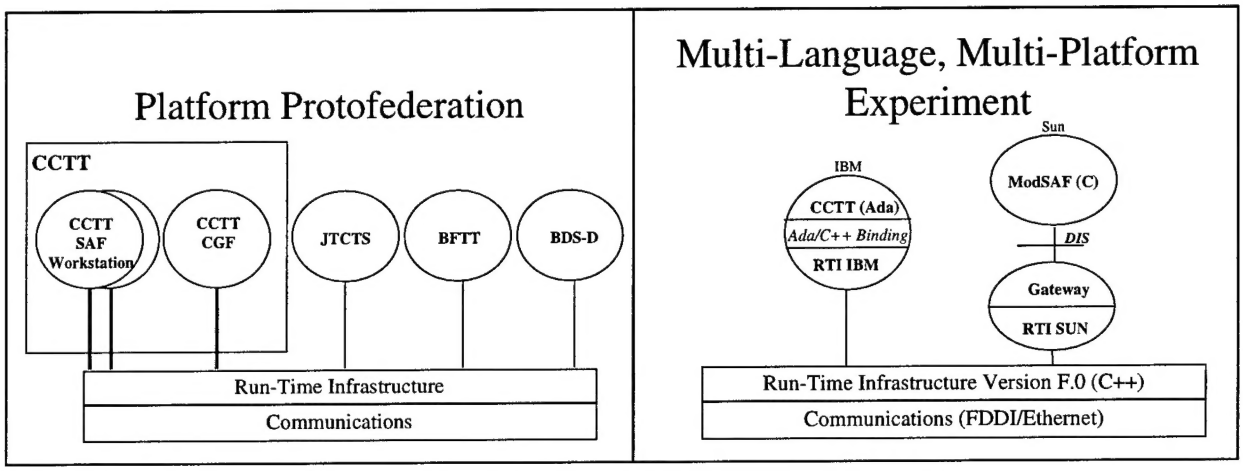
Participation of CCTT SAF in HLA-Platform Protofederation (HLA/PPF) DO #0004



Project Description:

As part of the Defense Modeling and Simulation Office (DMSO) High Level Architecture (HLA) development effort, the Semi-Automated Forces (SAF) subsystems of the Close Combat Tactical Trainer (CCTT) were modified to support CCTT participation in the Platform Proto-Federation (PPF) experiment. Following the prototyping effort, DMSO sponsored continued research to support the evolution of HLA.

The first phase of the HLA PPF project was conducted from March to October 1996 and focused on participation in the PPF experiments. Much of the project effort focused on modifying CCTT SAF and its use of DIS to support HLA. During this phase, the problem of DIS migration to HLA was explored, an HLA interface developed, and modifications made to CCTT SAF to support HLA-based information exchange. Working with other PPF participants, the PPF experiment concept was developed, a Federation Object Model (FOM) developed, and the experiment conducted.

The second phase of the project, conducted from November 1996 through May 1997, supported the evolution of HLA. An IBM compatible version of the Runtime Infrastructure (RTI) version F.0 was developed, providing accessibility for IBM users. The project also developed Ada support for HLA by implementing the Ada Application Programmer Interface (API) and binding code to allow the Ada API to work with the C++ based RTI. The second phase also involved some initial experimentation to explore the ability of HLA to support a particular federate's participation in multiple federation executions.

User Objectives:

- To conduct the PPF experiments with CCTT SAF participation.
- To evaluate the problem of the migration of DIS-based legacy systems to HLA.
- To develop an IBM compatible version of RTI F.0.
- To implement the Ada API and develop necessary binding code allowing use of the C++-based RTI.
- To conduct experiments to explore multiple federation executions.

ADST II Contributions:

- HLA implementation experience for exploring DIS-based legacy system migration to HLA.
- CCTT SAF HLA interface.
- Ada support for HLA.
- IBM Version of the RTI F.0
- Two papers for the Spring 97 SIW: "Implementation of the High Level Architecture into DIS-Based Legacy Simulations" and "Application Programming Interfaces for the HLA Runtime Infrastructure"
- Produced a technical paper for SIMTECT '97 which took the best paper award: "Implementation of the High Level Architecture into DIS-Based Legacy Simulations"

Technical Approach Summary:

The ADST II technical approach for the first phase of the project involved working with other PPF participants to develop the FOM for the experiment. The project then performed the re-engineering of the distributed interface of CCTT SAF to use HLA instead of DIS. Modifications were made to accomodate the requirements of the PPF FOM. For the demonstration, engineering support was provided for integration, testing and conduct of the experiment.

The phase 2 approach to port RTI F.0 to the IBM platform involved coordination with Sun platform RTI developers to ensure that the functionality of the port was maintained and consistent with Sun RTI operation. A short experiment involving ModSAF running on a Sun with the Sun version of RTI F.0 and CCTT SAF running on the IBM with the IBM ported RTI was successfully conducted. The phase 2 development of the Ada API was closely coordinated with developers of the C++ and Java versions to ensure consistency between APIs. Phase 2 multifederation execution experiments were closely coordinated with the Federation Management Technical Exchange group which helped to identify the issues to be explored and provided a forum for feedback on approaches and results.

Achievement Summary:

- HLA support for CCTT SAF.
- Basis for exploring DIS-system transition to HLA.
- IBM support for RTI F.0.
- Ada API concept verification and HLA support for Ada-based systems.
- Initial implementation of Multiple Federation Execution concept for CCTT SAF.

Outputs:

ITEM	DESCRIPTION / REFERENCE
RTI Ada/C++ Interface VDD	Document # ADST-II-CDRL-HLAPPF-9700130
CCTT Systems Services VDD	Document # ADST-II-CDRL-HLAPPF-9700123
Final Report	Document # ADST-II-CDRL-019R-9600333A
CCTT HLA Code	Software # MD0282
RTI Ada/C++ Interface Code	Software # MD0283